



[7590-01-P]

## NUCLEAR REGULATORY COMMISSION

[NRC-2019-0208]

### Supplemental Guidance Regarding the Chromium-Coated Zirconium Alloy Fuel Cladding Accident Tolerant Fuel Concept

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Draft interim staff guidance; request for comment.

**SUMMARY:** The U.S. Nuclear Regulatory Commission (NRC) is soliciting public comment on its draft interim staff guidance which is intended to facilitate the staff's understanding of the in-reactor phenomena important to safety for the chromium-coated zirconium alloy fuel cladding concepts, as well as to provide guidance for NRC staff reviewing vendor applications. Chromium-coated zirconium alloy fuel cladding concepts are being pursued by several U.S. fuel vendors as part of the U.S. Department of Energy's accident tolerant fuel program.

**DATES:** Submit comments by **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**. Comments received after this date will be considered if it is practical to do so, but the Commission is able to ensure consideration only for comments received before this date.

**ADDRESSES:** You may submit comments by any of the following methods:

- **Federal Rulemaking Web Site:** Go to <https://www.regulations.gov> and search for Docket ID **NRC-2019-0208**. Address questions about NRC dockets IDs in [www.regulations.gov](https://www.regulations.gov) to Jennifer Borges; telephone: 301-287-9127; e-mail:

Jennifer.Borges@nrc.gov. For technical questions, contact the individual listed in the **FOR FURTHER INFORMATION CONTACT** section of this document.

- **Mail comments to:** Office of Administration, Mail Stop: TWFN-7-A60M, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, ATTN: Program Management, Announcements and Editing Staff.

For additional direction on obtaining information and submitting comments, see “Obtaining Information and Submitting Comments” in the **SUPPLEMENTARY INFORMATION** section of this document.

**FOR FURTHER INFORMATION CONTACT:** Tekia Govan, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington DC 20555–0001; telephone: 301-415-6197; email: Tekia.Govan@nrc.gov.

**SUPPLEMENTARY INFORMATION:**

**I. Obtaining Information and Submitting Comments**

**A. Obtaining Information**

Please refer to Docket ID **NRC-2019-0208** when contacting the NRC about the availability of information for this action. You may obtain publicly-available information related to this action by any of the following methods:

- **Federal Rulemaking Web Site:** Go to <https://www.regulations.gov> and search for Docket ID **NRC-2019-0208**.

- **NRC’s Agencywide Documents Access and Management System (ADAMS):** You may obtain publicly-available documents online in the ADAMS Public Documents collection at <https://www.nrc.gov/reading-rm/adams.html>. To begin the search, select “Begin Web-based ADAMS Search.” For problems with ADAMS, please contact the NRC’s Public Document Room (PDR) reference staff at 1-800-397-4209,

301-415-4737, or by e-mail to [pdr.resource@nrc.gov](mailto:pdr.resource@nrc.gov). The Draft Interim Staff Guidance Supplemental Guidance Regarding the Chromium-coated Zirconium Alloy Fuel Cladding Accident Tolerant Fuel Concept is available in ADAMS under Accession No. ML19276G621.

- **NRC's PDR:** You may examine and purchase copies of public documents at the NRC's PDR, Room O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

#### B. Submitting Comments

Please include Docket ID **NRC-2019-0208** in your comment submission. The NRC cautions you not to include identifying or contact information that you do not want to be publicly disclosed in your comment submission. The NRC will post all comment submissions at <https://www.regulations.gov> as well as enter the comment submissions into ADAMS. The NRC does not routinely edit comment submissions to remove identifying or contact information.

If you are requesting or aggregating comments from other persons for submission to the NRC, then you should inform those persons not to include identifying or contact information that they do not want to be publicly disclosed in their comment submission. Your request should state that the NRC does not routinely edit comment submissions to remove such information before making the comment submissions available to the public or entering the comment into ADAMS.

## II. Background

This interim staff guidance (ISG) is intended to provide guidance for NRC staff reviewing applications involving fuel products with chromium-coated zirconium alloy cladding. For coated claddings of this type, a phenomena identification and ranking table (PIRT) was generated for the NRC by Pacific Northwest National Laboratory; the

guidance provided in this ISG extensively references the PIRT report, “Degradation and Failure Phenomena of Accident Tolerant Fuel Concepts: Chromium Coated Zirconium Alloy Cladding,” issued June 2019. The suggested cladding properties specified acceptable fuel design limits and new failure mechanisms sections from the PIRT are replicated in Appendices B and C. These appendices supersede Sections 5.1 and 5.2 of the PIRT report.

This ISG is not intended as stand-alone review guidance, but instead supplements NUREG-0800, “Standard Review Plan,” Section 4.2, “Fuel System Design,” and discusses the potential impact of coated claddings on reviews performed under Standard Review Plan (SRP), Section 4.3, “Nuclear Design,” Section 4.4, “Thermal and Hydraulic Design,” and Chapter 15, “Transient and Accident Analysis.” In addition to the guidance provided in this ISG, reviewers of coated cladding applications should familiarize themselves with the PIRT report and with the relevant sections of the SRP.

The PIRT report and this ISG focus primarily on metallic chromium coatings applied to a zirconium alloy base metal, with some additional discussion that is applicable to chromium-based ceramic coatings. Reviewers of submittals on ceramic chromium-coated zirconium alloy claddings should carefully read the PIRT to determine the applicability to the review.

This ISG does not apply to reviews of fuel products other than metallic or ceramic chromium-based coatings on a zirconium alloy substrate.

Dated at Rockville, Maryland, this 18<sup>th</sup> day of October, 2019.

For the Nuclear Regulatory Commission.

Tekia V. Govan, Project Manager,  
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